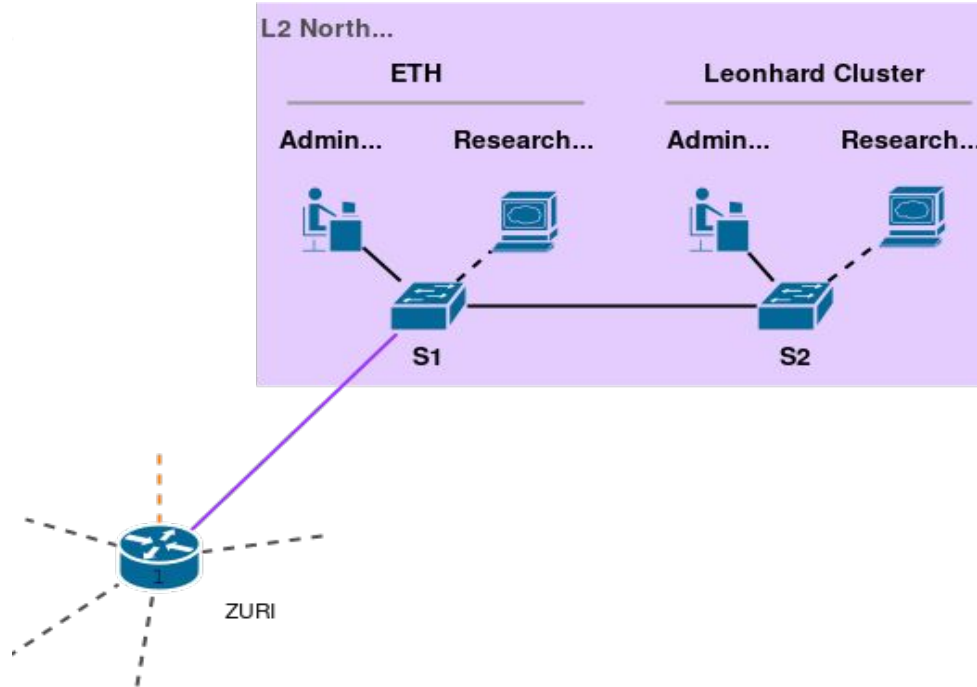
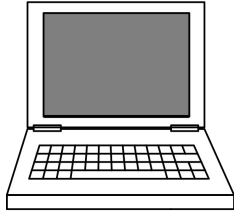


Why *disjoint* subnets for admin and research hosts?



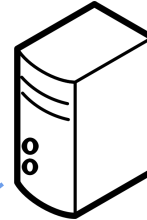
What happens if they belong to the *same* subnet?

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



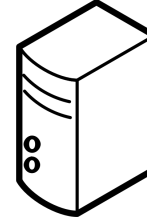
L2 admin host

intf: 10.0.1.4/24 gw: 10.0.1.2
MAC: 44:44:44:44:44:44



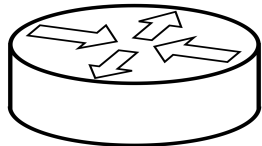
L2 research host A

intf: 10.0.1.5/24 gw: 10.0.1.2
MAC: 55:55:55:55:55:55

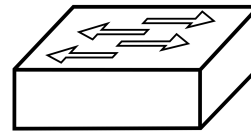


L2 research host B

L2.10: 10.0.1.1/24
L2.20: 10.0.1.2/24



L3 router



L2 switch

tag:10

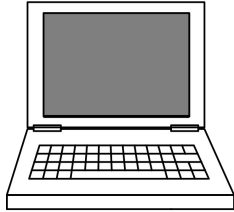
tag: 20

tag: 20

trunk: [10, 20]

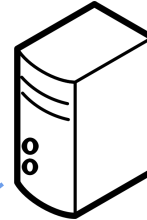
Research host A (10.0.1.4) pings research host B (10.0.1.5)

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



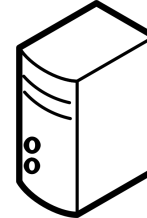
L2 admin host

intf: 10.0.1.4/24 gw: 10.0.1.2
MAC: 44:44:44:44:44:44



L2 research host A

intf: 10.0.1.5/24 gw: 10.0.1.2
MAC: 55:55:55:55:55:55



L2 research host B

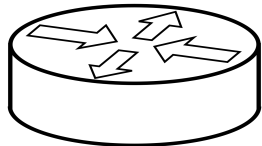
tag:10

tag: 20

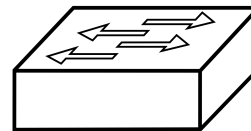
tag: 20

trunk: [10, 20]

L2.10: 10.0.1.1/24
L2.20: 10.0.1.2/24

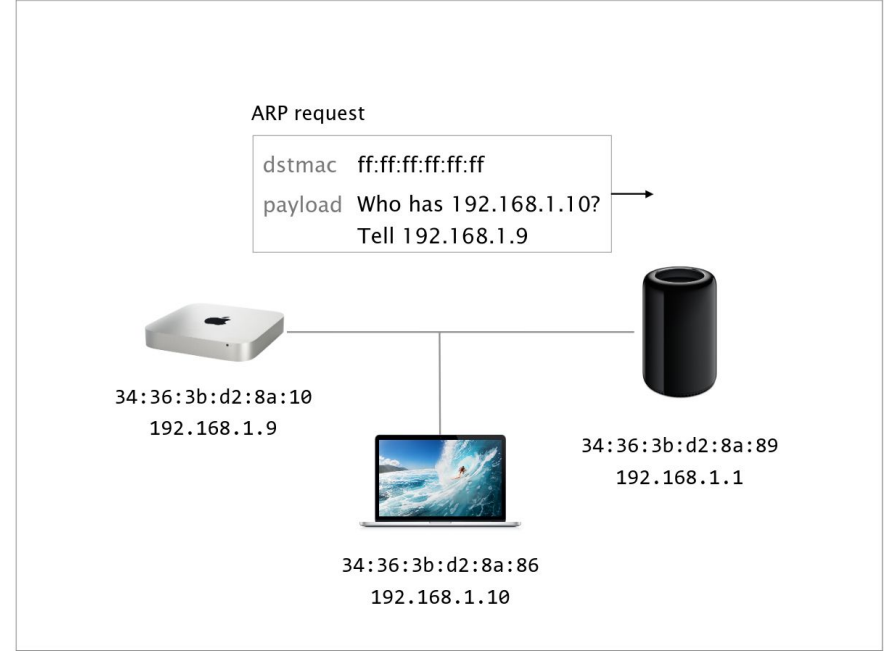
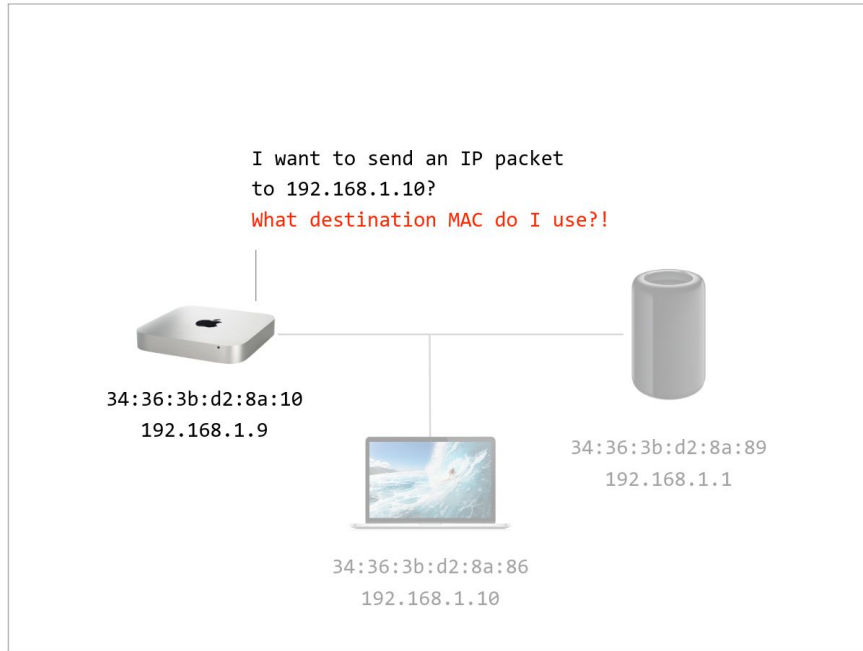


L3 router

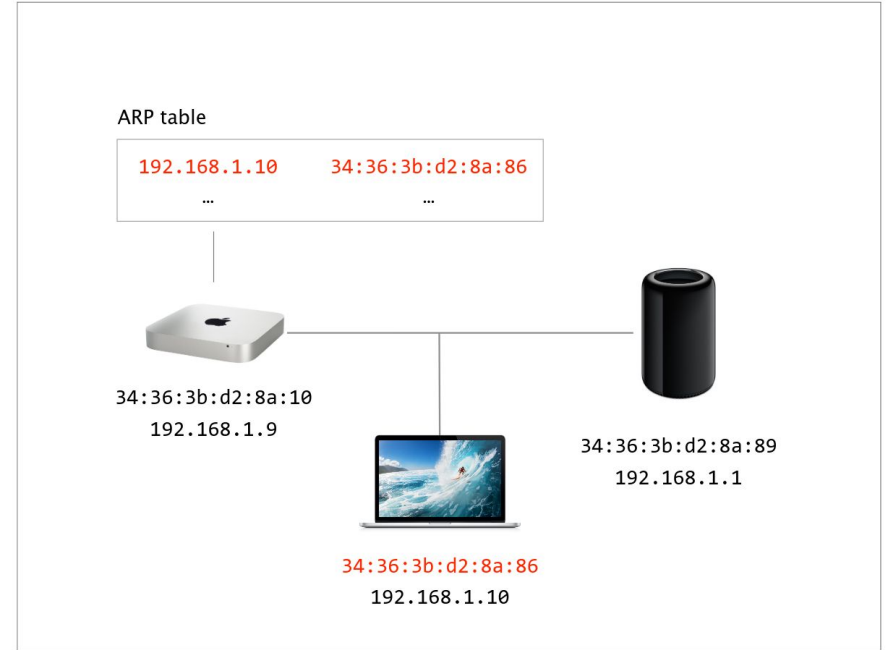
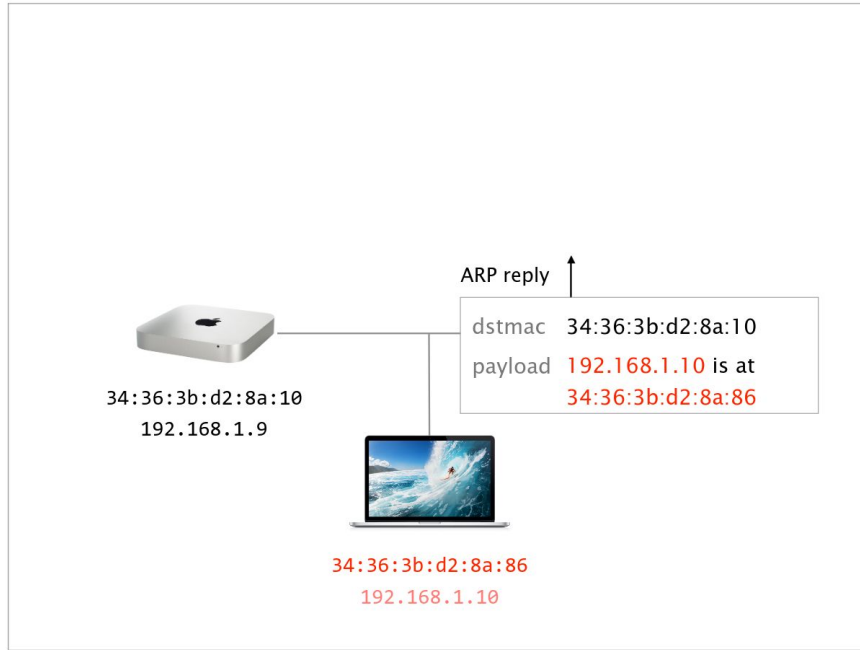


L2 switch

Hosts within the same subnet use MAC to communicate

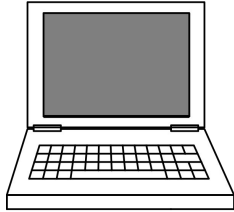


ARP enables a host to obtain MAC from IP



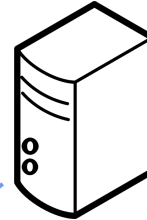
Research host A (10.0.1.4) pings research host B (10.0.1.5)

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



L2 admin host

intf: 10.0.1.4/24 gw: 10.0.1.2
MAC: 44:44:44:44:44:44



L2 research host A

Who has MAC
of 10.0.1.5 😊?

tag:10

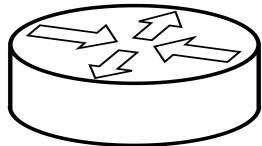
tag: 20

intf: 10.0.1.5/24 gw: 10.0.1.2
MAC: 55:55:55:55:55:55



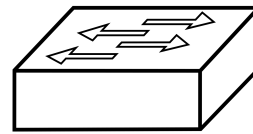
L2 research host B

L2.10: 10.0.1.1/24
L2.20: 10.0.1.2/24



L3 router

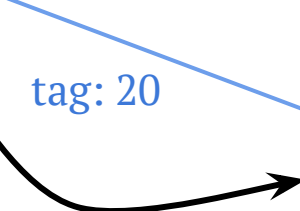
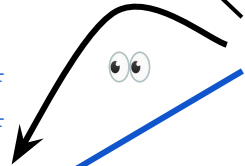
trunk: [10, 20]



L2 switch

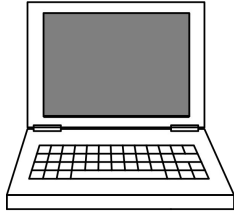
tag: 20

Who has MAC
of 10.0.1.5 🙄?



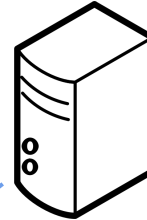
Research host A (10.0.1.4) pings research host B (10.0.1.5)

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



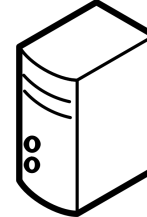
L2 admin host

intf: 10.0.1.4/24 gw: 10.0.1.2
MAC: 44:44:44:44:44:44



L2 research host A

intf: 10.0.1.5/24 gw: 10.0.1.2
MAC: 55:55:55:55:55:55



L2 research host B

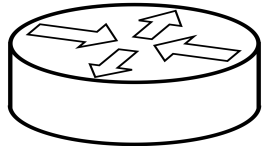
tag: 10

tag: 20

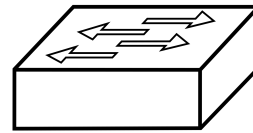
tag: 20

trunk: [10, 20]

L2.10: 10.0.1.1/24
L2.20: 10.0.1.2/24



L3 router

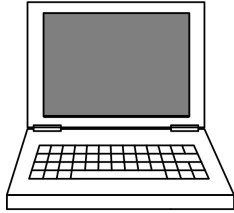


L2 switch

I have 😊 it's
55:55:55:55:55

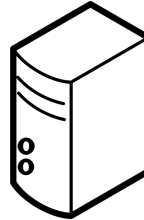
Research host A (10.0.1.4) pings admin host (10.0.1.3)

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



L2 admin host

intf: 10.0.1.4/24 gw: 10.0.1.2
MAC: 44:44:44:44:44:44



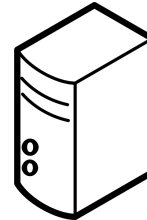
L2 research host A

Who has MAC
of 10.0.1.3 🤔?

tag:10

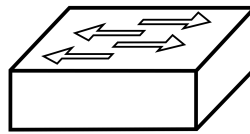
tag: 20

intf: 10.0.1.5/24 gw: 10.0.1.2
MAC: 55:55:55:55:55:55



L2 research host B

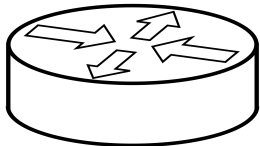
L2.10: 10.0.1.1/24
L2.20: 10.0.1.2/24



L2 switch

tag: 20

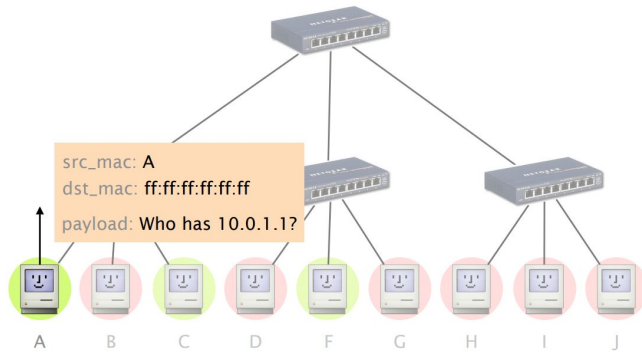
trunk: [10, 20]



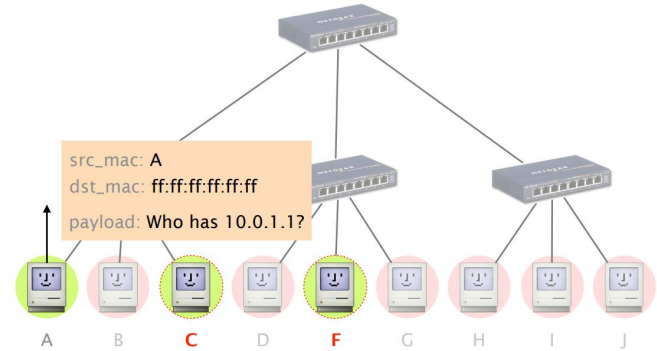
L3 router

Switch does *not* relay packets between different vlan tags

Consider that A sends a broadcast frame
say, an ARP request

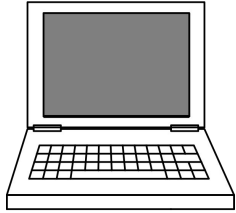


That frame should be received by all staff members:
i.e. C and F, and *only* them



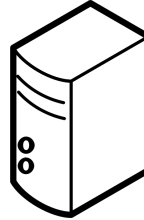
Research host A (10.0.1.4) pings admin host (10.0.1.3)

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



L2 admin host

intf: 10.0.1.4/24 gw: 10.0.1.2
MAC: 44:44:44:44:44:44



L2 research host A

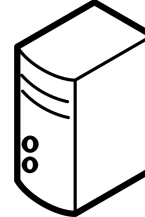
Who has MAC
of 10.0.1.3 😊?



tag:10

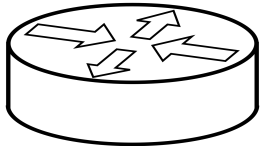
tag: 20

intf: 10.0.1.5/24 gw: 10.0.1.2
MAC: 55:55:55:55:55:55



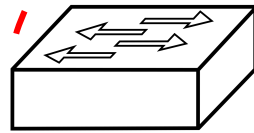
L2 research host B

L2.10: 10.0.1.1/24
L2.20: 10.0.1.2/24



L3 router

trunk: [10, 20]



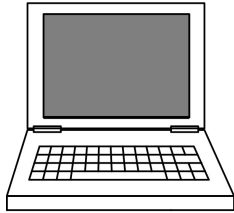
L2 switch

tag: 20



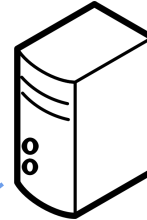
How about using *different* subnets?

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



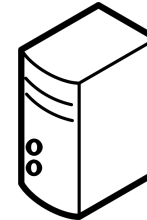
L2 admin host

intf: 10.0.2.4/24 gw: 10.0.2.2
MAC: 44:44:44:44:44:44



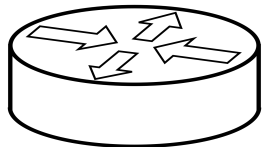
L2 research host A

intf: 10.0.2.5/24 gw: 10.0.2.2
MAC: 55:55:55:55:55:55

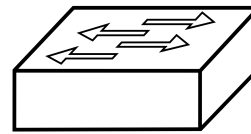


L2 research host B

L2.10: 10.0.1.1/24
L2.20: 10.0.2.2/24



L3 router



L2 switch

tag:10

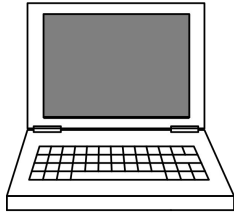
tag: 20

tag: 20

trunk: [10, 20]

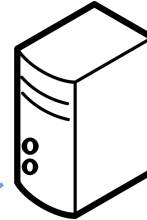
Research host A (10.0.2.4) pings admin host (10.0.1.3)

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



L2 admin host

intf: 10.0.2.4/24 gw: 10.0.2.2
MAC: 44:44:44:44:44:44



L2 research host A

intf: 10.0.2.5/24 gw: 10.0.2.2
MAC: 55:55:55:55:55:55



L2 research host B

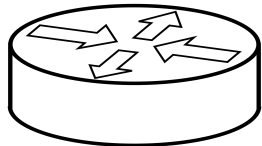
tag:10

tag: 20

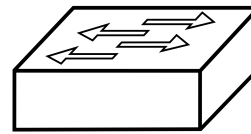
tag: 20

trunk: [10, 20]

L2.10: 10.0.1.1/24
L2.20: 10.0.2.2/24



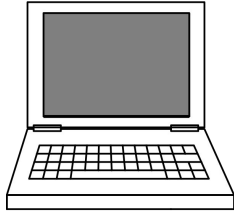
L3 router



L2 switch

Hosts throw unknown destination to the gateway as *default*

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



L2 admin host

intf: 10.0.2.4/24 gw: 10.0.2.2
MAC: 44:44:44:44:44:44



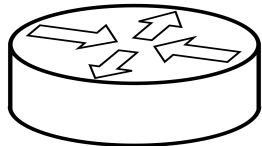
L2 research host A

Hey router, help me reach 10.0.1.3 🙏

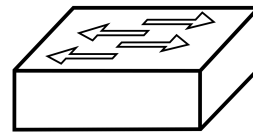
tag:10

tag: 20

L2.10: 10.0.1.1/24
L2.20: 10.0.2.2/24

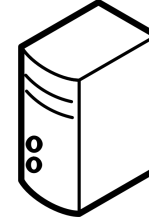


L3 router



L2 switch

intf: 10.0.2.5/24 gw: 10.0.2.2
MAC: 55:55:55:55:55:55



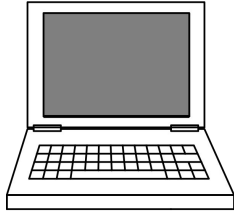
L2 research host B

tag: 20

trunk: [10, 20]

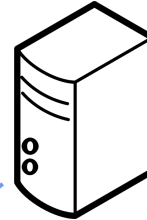
The router sends back the packet to admin host

intf: 10.0.1.3/24 gw: 10.0.1.1
MAC: 33:33:33:33:33:33



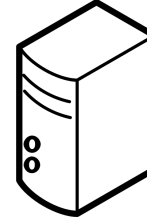
L2 admin host

intf: 10.0.2.4/24 gw: 10.0.2.2
MAC: 44:44:44:44:44:44



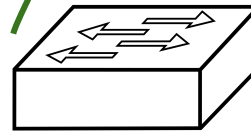
L2 research host A

intf: 10.0.2.5/24 gw: 10.0.2.2
MAC: 55:55:55:55:55:55



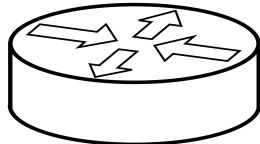
L2 research host B

I am within this
subnet -> ARP 🙌!



L2 switch

L2.10: 10.0.1.1/24
L2.20: 10.0.2.2/24



L3 router

trunk: [10, 20]

tag:10

tag: 20

tag: 20

